


DOE Hydrogen Program Record			
Record #:	5008	Date:	
Title:		December 28, 2005	
Hydrogen Demand in 2040 for FCVs			

**Items:**

- 64 million metric tons of hydrogen would be needed to power 300 million hydrogen fuel cell vehicles in 2040.
- 300 million FCVs would be 80% of the vehicle fleet of 375 million vehicles projected for 2040

**Data/References:**

The following values were based on the *VISION Model: Description of Model Used to Estimate the Impact of Highway Technologies and Fuels on Energy Use and Carbon Emissions to 2050*. Singh M., A. Vyas, and E. Steiner, Argonne National Laboratory, December 2003, ANL/ESD/04-1 ([www.transportation.anl.gov/pdfs/TA/299.pdf](http://www.transportation.anl.gov/pdfs/TA/299.pdf)).

1- 375 million vehicles projected for 2040 in the U.S. Vehicles refer to light duty vehicles as defined in the model.

2- 300 million FCVs is based on the model's assumption of the following FCV market sales rates: 4% in 2018, 27% in 2020, 78% in 2030, and 100% by 2038.

3- 13,000 miles per light duty vehicle in 2040. (Also from *Transportation Energy Data Book: Edition 23-2003*, Table 7.4 (7-4).

4- 24.3 miles per gallon for conventional light duty vehicles in 2040.


5- 2.5 is the assumed ratio of FCVs miles per kg (or gge) of hydrogen to miles per gallon of gasoline for conventional vehicles.

**Calculations:**

300 million Fuel cell vehicles x 13,000 miles per vehicle per year = 3,900 billion miles driven per year

24.3 miles per gallon for conventional vehicles x 2.5 factor for fuel cell vehicle in 2040 = 60.75 miles/kg of H<sub>2</sub> for a fuel cell vehicle.

3,900 billion miles divided by 60.75 miles/kg of hydrogen = 64 million metric tons of hydrogen required.

<b>Originator:</b> Fred Joseck, Mark Paster		
<b>Approved by:</b> JoAnn Milliken	<b>Date:</b> January 3, 2006	
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